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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,703	09/25/2003	John D. Irish	ROC920030090US1	6165
30206	7590	07/22/2009	EXAMINER	
IBM CORPORATION ROCHESTER IP LAW DEPT. 917 3605 HIGHWAY 52 NORTH ROCHESTER, MN 55901-7829			ROJAS, MIDYS	
			ART UNIT	PAPER NUMBER
			2185	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/670,703	<b>Applicant(s)</b> IRISH ET AL.	
	<b>Examiner</b> MIDYS ROJAS	<b>Art Unit</b> 2185	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments, see Appeal Brief filed 4/13/2009, with respect to the rejection(s) of claim(s) 1-34 under 35 USC 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Shaylor (US 2002/0108025 A1).

After careful consideration of Applicant's remarks presented in the Appeal Brief, the examiner has re-opened prosecution of this application.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-34 are rejected under 35 U.S.C. 103(a) as being obvious over Bonola (2001/0011338) in view of Shaylor (US 2002/0108025 A1).

Regarding Claim 1, Bonola discloses a method comprising:

receiving a set of data (in the process of executing an instruction within an application program, paragraph 0013);

determining whether a free entry of a size required by a portion of the set of data exists in one of a plurality of sections of a memory (executes HeapAlloc... examine heap data structure [to] determine if there is an appropriately sized heap sub-region in

the free list wherein the free list contains unassigned heap sub-regions, paragraph 0037);

determining whether the memory includes one or more sections of an unallocated size (unassigned heap sub-region, paragraph 0034-0035); and

if a free group entry of the size required by the portion of the set of data does not exist in one of the plurality of sections of the memory (if N exceeds M, then there is no heap sub-region within the heap that can accommodate the demand..., paragraph 0038).

Bonola does not teach determining whether the memory includes one or more sections of an unallocated size; and if the memory includes one or more sections of an unallocated size, allocating one of the sections of an unallocated size to the size required by the portion of the set of data thereby creating a section of a dynamically allocated size, the section of the dynamically allocated size including one or more group entries of the size required by the portion of the set of data, the dynamically allocated size being the smallest sized group entry necessary to store the portion of the set of data.

Shaylor teaches determining whether the memory includes one or more sections of an unallocated size (if a task requests additional memory space for the heap, it is determined if the address space immediately adjacent to the heap is available, paragraph 0038); and if the memory includes one or more sections of an unallocated size (if the space adjacent to the heap is available...), allocating one of the sections of an unallocated size to the size required by the portion of the set of data thereby creating

a section of a dynamically allocated size (allocate the requested memory address space from the space adjacent to the heap, paragraph 0038), the section of the dynamically allocated size including one or more group entries of the size required by the portion of the set of data, the dynamically allocated size being the smallest sized group entry necessary to store the portion of the set of data (the allocated space is equivalent to the requested memory address space, therefore, it is the smallest size necessary, paragraph 0038). It would have been obvious to one of ordinary skill in the art that time the invention was made to modify the invention of Bonola to include the heap memory allocation method of Shaylor since this allows for the dynamic allocation of memory to the heap as needed (paragraph 0006).

Regarding Claim 2, Bonola discloses a method wherein determining whether a free group entry of the size required by the portion of the set of data exists in one of a plurality of sections of the memory includes determining whether a free group entry of the size required by the portion of the set of data for uniquely identifying each portion of the set of data exists in one of the plurality of sections of memory (...no heap sub-region within heap 302 can accommodate a demand for X bytes of memory from application 202, paragraph 0038 wherein the memory is allocated to the heap data structure).

Regarding Claim 3, Bonola discloses a method wherein determining whether the memory includes one or more sections of an unallocated size includes accessing a

control structure for one or more sections of the memory, the control structure storing information about the structure of a section (heap data structure 304).

Regarding Claim 4, Bonola discloses a method further comprising, from the section of a dynamically allocated size, allocating an initial group entry of the size required by the portion of the set of data for storing the portion of the set of data (... the address of the heap sub-region contained in the entry is then assigned to the application, paragraph 0037).

Regarding Claim 5, Bonola discloses a method further comprising: receiving a modified set of data; determining whether a portion of the modified set of data may be stored more efficiently in a group entry of a different size from another section of the memory such that the aggregate number of unused entries in the group entries used for storing the modified set of data is minimized (...if the remaining half of the heap sub-region contains twice as much memory as is required by the requesting application, the remaining half of the heap sub-region can be further divided..., paragraph 0039); allocating a group entry of the different size required by the portion of the modified set of data from another section of the memory to store the portion of the modified set of data (repeating steps 532-540 until a heap sub-region is yielded which does not have twice as much memory as is required and then assigning the sub-region to the application... paragraph 0039); and de-allocating the initial group entry to the section of memory from which the initial group entry was allocated (wherein de-allocation of the initial group

entry occurs when the newly selected heap sub-region is placed in the N list and replaces the initial entry, Figure 5).

Regarding Claim 6, Bonola discloses a method further comprising updating the control structure that stores information about the structure of the other section (...an entry is removed from the N list in the free list 306, paragraph 0038).

Regarding Claim 7, Bonola discloses a method further comprising updating the control structure that stores information about the structure of the section of memory from which the initial group entry was allocated (...an entry is removed from the N list in the free list 306, paragraph 0038).

Regarding Claim 8, Bonola discloses a method wherein de-allocating the initial group entry to the section of memory from which the initial group entry was allocated leaves all entries of the section unused (when the application is finished using an assigned heap sub-region, it can return the heap sub-region to the heap using the HeapFree instruction, thus leaving those entries unused, paragraph 0040).

Regarding Claim 9, Bonola discloses a method further comprising clearing the group entry size allocation of the section (HeapFree instruction clears the allocation of the sections since the heap contains unassigned memory, paragraph 0040-0041).

Regarding Claim 10, Bonola discloses a method further comprising, if the memory does not include one or more sections of an unallocated size, determining whether a free group entry of a size larger than the size required by the portion of the data exists (Paragraph 0039, heap sub-region with the higher memory address is entered into the N list...), wherein sections allocated to the smallest available size larger than the size required by the portion of the data are checked prior to sections allocated to larger available sizes (continue dividing sub-region in half until sub-region contains less than twice as much memory as required).

Regarding Claim 11, Bonola discloses a method further comprising, if a free group entry of a size larger than the size required by the portion of the data exists in a section allocated to a size larger than the size required by the portion of data, allocating an initial group entry of the size larger than the size required by the portion of the set of data from the section allocated to a size larger than the size required by the portion of the data for storing the portion of the set of data (paragraph 0039, if the sub-region contains less than twice as much memory as needed... the sub-region should be assigned).

Regarding Claim 12, Bonola discloses a method further comprising, if a free group entry of a size larger than the size required by the portion of the data does not exist outputting an error condition (Paragraph 0038, there is no sub-region within the heap that can accommodate a demand for X bytes... HeapAlloc instruction will fail...).



Claim 13 is rejected using the same rationale as that of Claim 5.

Claim 14 is rejected using the same rationale as that of Claim 6.

Claim 15 is rejected using the same rationale as that of Claim 7.

Claim 16 is rejected using the same rationale as that of Claim 8.

Claim 17 is rejected using the same rationale as that of Claim 9.

Claim 18 is rejected using the same rationale as that of Claim 1 wherein the memory is represented by system memory 114, the plurality of registers are within heap data structure 304, and the dynamic allocation logic is equivalent to the method for dynamically allocating memory in a computer system of the invention (paragraph 0013, and Figure 3).

Claim 19 is rejected using the same rationale as that of Claim 2.

Claim 20 is rejected using the same rationale as that of Claim 3.

Claim 21 is rejected using the same rationale as that of Claim 4.

Claim 22 is rejected using the same rationale as that of Claim 5.

Claim 23 is rejected using the same rationale as that of Claim 6.

Claim 24 is rejected using the same rationale as that of Claim 7.

Claim 25 is rejected using the same rationale as that of Claim 8.

Claim 26 is rejected using the same rationale as that of Claim 9.

Claim 27 is rejected using the same rationale as that of Claim 10.

Claim 28 is rejected using the same rationale as that of Claim 11.

Claim 29 is rejected using the same rationale as that of Claim 12.

Claim 30 is rejected using the same rationale as that of Claim 5.

Claim 31 is rejected using the same rationale as that of Claim 6.

Claim 32 is rejected using the same rationale as that of Claim 7.

Claim 33 is rejected using the same rationale as that of Claim 8.

Claim 34 is rejected using the same rationale as that of Claim 9.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MIDYS ROJAS whose telephone number is (571)272-4207. The examiner can normally be reached on M-TH 6:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sanjiv Shah can be reached on (571) 272-4098. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2185

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sanjiv Shah/  
Supervisory Patent Examiner, Art Unit 2185

/Midys Rojas/  
Examiner, Art Unit 2185

MR